CoderDojo Athenry

Scratch Beginners

Code and notes by Michael Madden and Martha Fahy, 2013

CoderDojo Athenry

"Above all, be cool"

Every week:

✓ Sign in at the door

If you are new:

✓ Fill in Registration Form

✓ Ask a Mentor how to get started

Make sure you are on the Athenry Parents/Kids Google Group: email coderdojoathenry@gmail.com

Wifi password: **coderdojowireless**

Today's Ninja Challenge: Write Your First Computer Game!

Today's Big Ideas

What is Coding?

Who Writes Code?

What is Scratch?

How Can We Write Code?

Programming Languages

- Tell computer how to perform tasks
- C, C++, Java, Visual Basic, Python, JavaScript, PHP, HTML5

```
public static void calcWages()
{
    double rate, hrs, wage, over, total;

    rate = askForNumber("Enter Hourly Rate:");
    hrs = askForNumber("Enter Hours Worked:");

    if (hrs <= 40) {
        wage = rate * hrs;
        over = 0;
    }
    else {
        wage = rate * 40;
        over = (hrs - 40) * 1.5 * rate;
    }
    total = wage + over;

    JOptionPane.showMessageDialog(null, "Total wages are " + total);
}
```

Some Java Code

Programming Languages

Input, Output & Store Data

- E.g. text, numbers

Operate on Data

- E.g. add numbers, change text

Loops

- Repeat commands several times

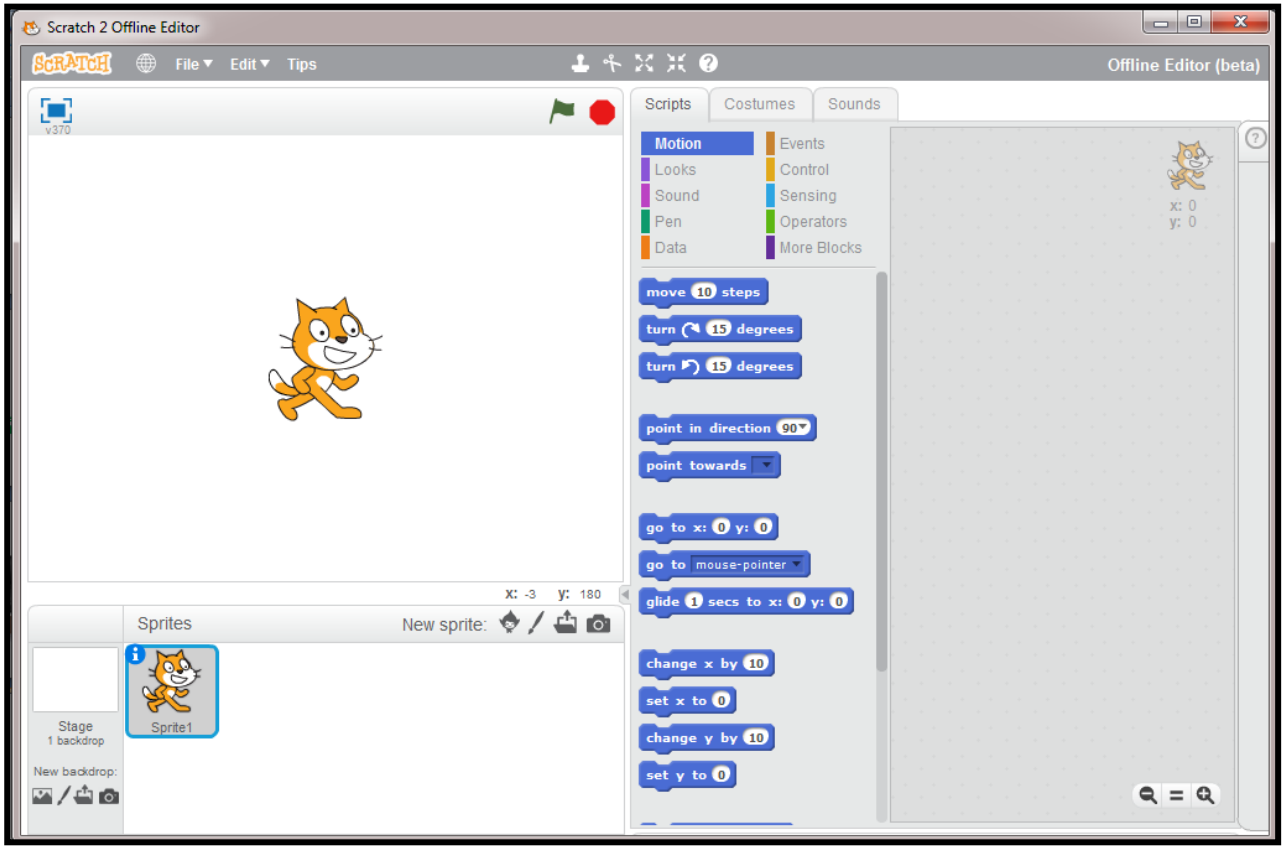
Decisions

- Do something IF something else is true

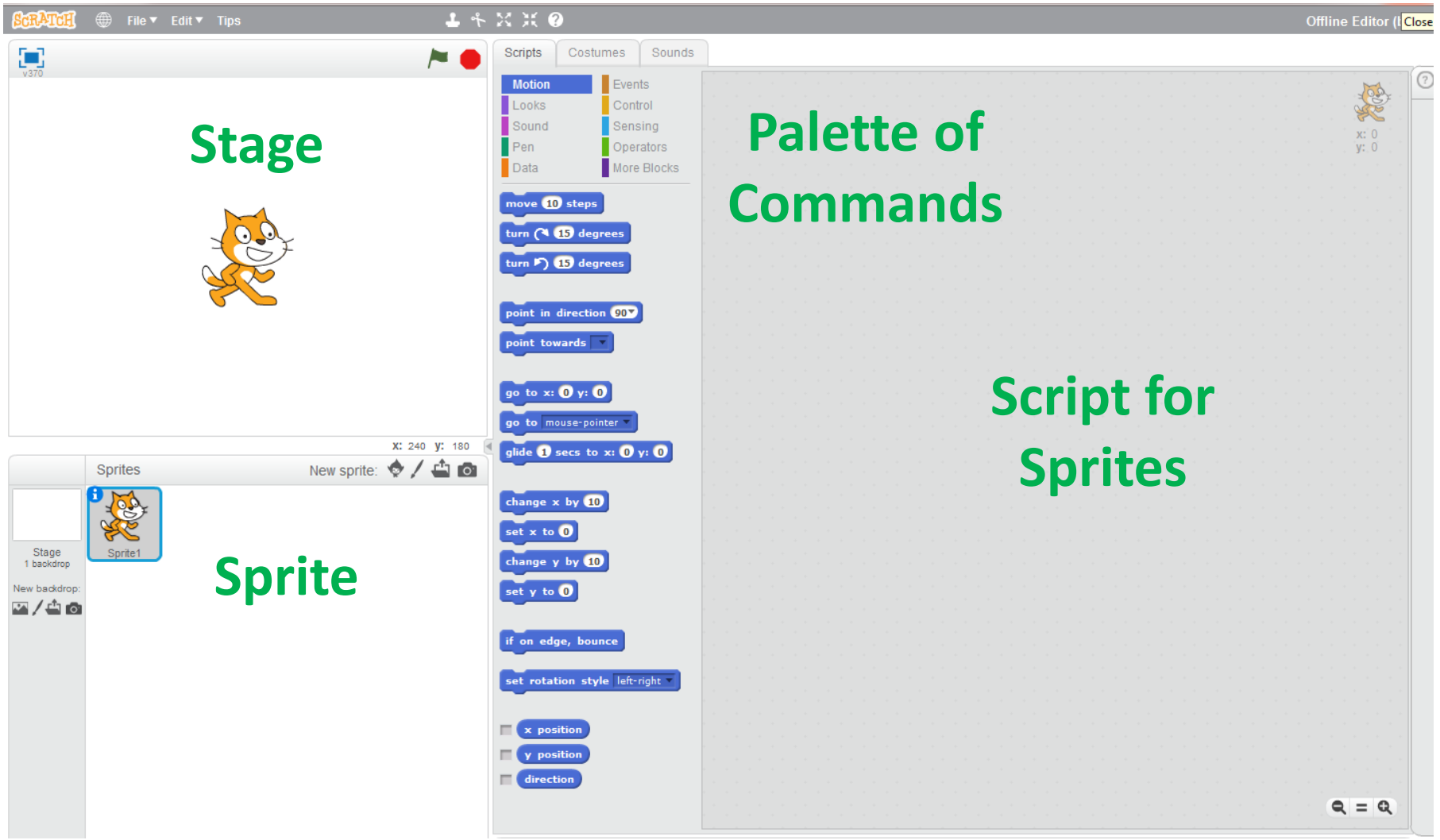
Scratch

http://scratch.mit.edu

- Free & Open Source
- Windows, Linux, Mac
- Palette of Commands
- Games & Animation
- Encourages Sharing



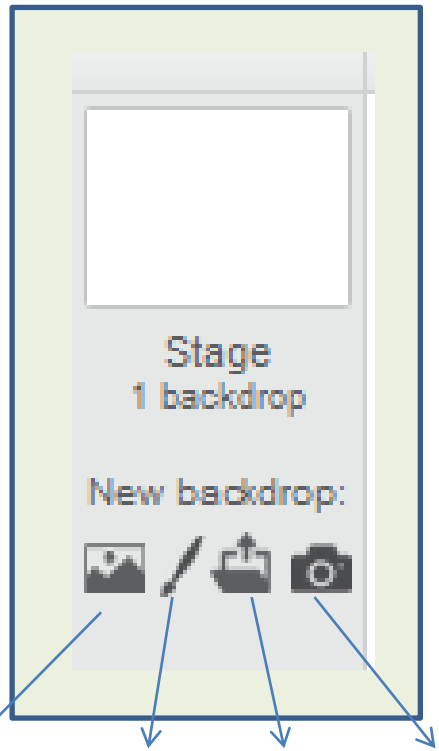
Scratch's Interface



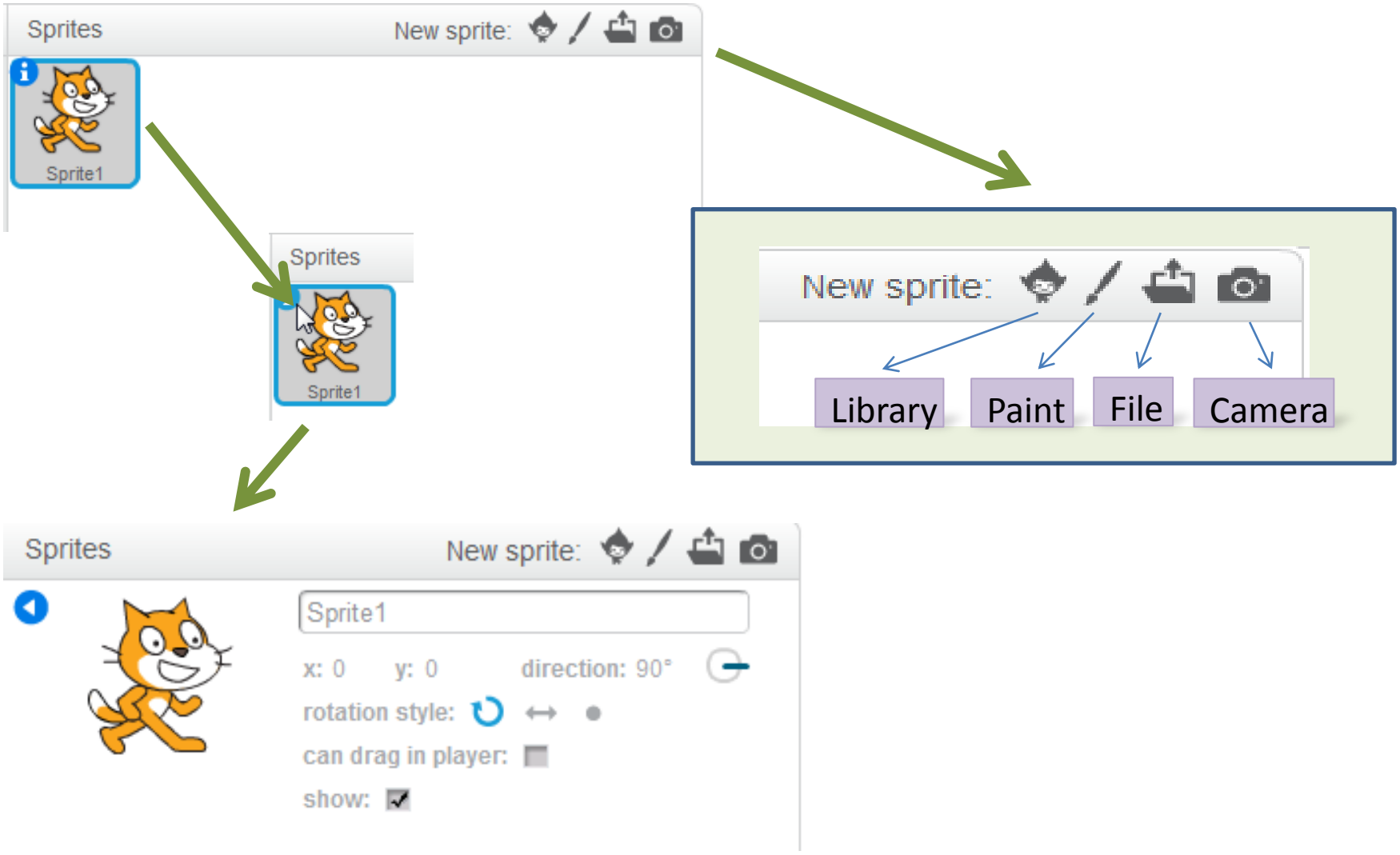
The Stage

Full Screen

Starts/Stop

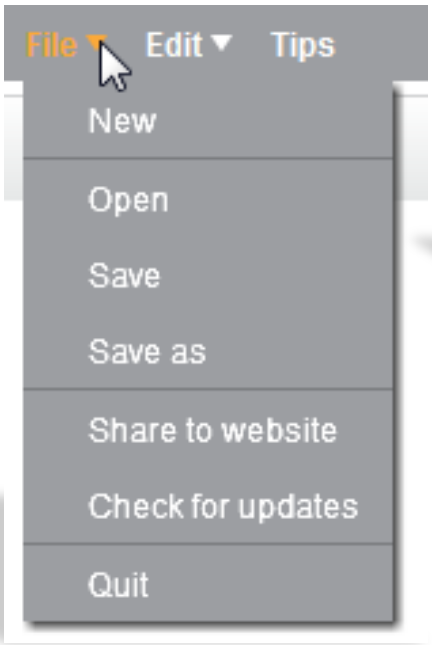


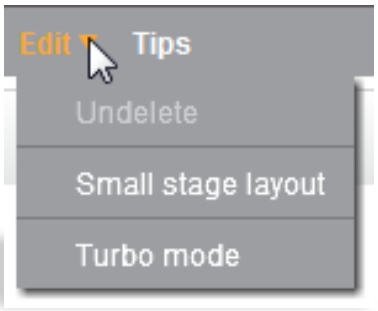
The Sprites
(your characters)



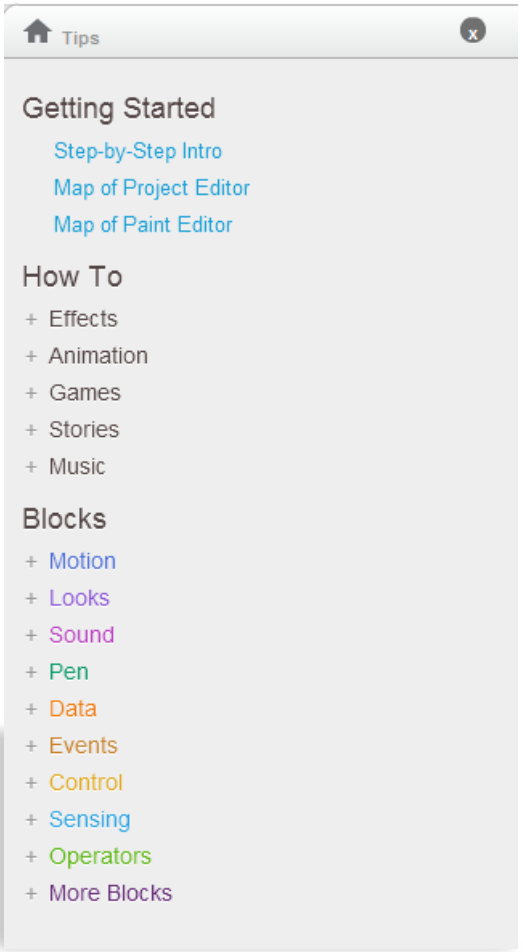
Main Menu


SCRATCH
File
Edit
Tips

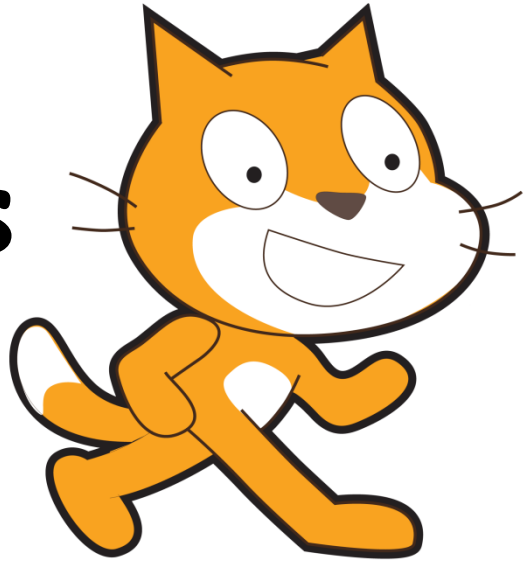

File
Edit
Tips
New
Open
Save
Save as
Share to website
Check for updates
Quit

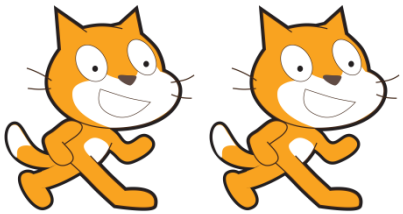

Edit
Tips
Undelete
Small stage layout
Turbo mode


Tips

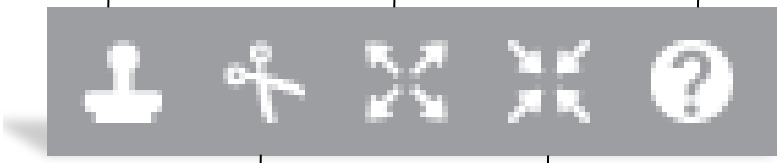

Tips
Getting Started
Step-by-Step Intro
Map of Project Editor
Map of Paint Editor
How To
+ Effects
+ Animation
+ Games
+ Stories
+ Music
Blocks
+ Motion
+ Looks
+ Sound
+ Pen
+ Data
+ Events
+ Control
+ Sensing
+ Operators
+ More Blocks

Cursor Tools



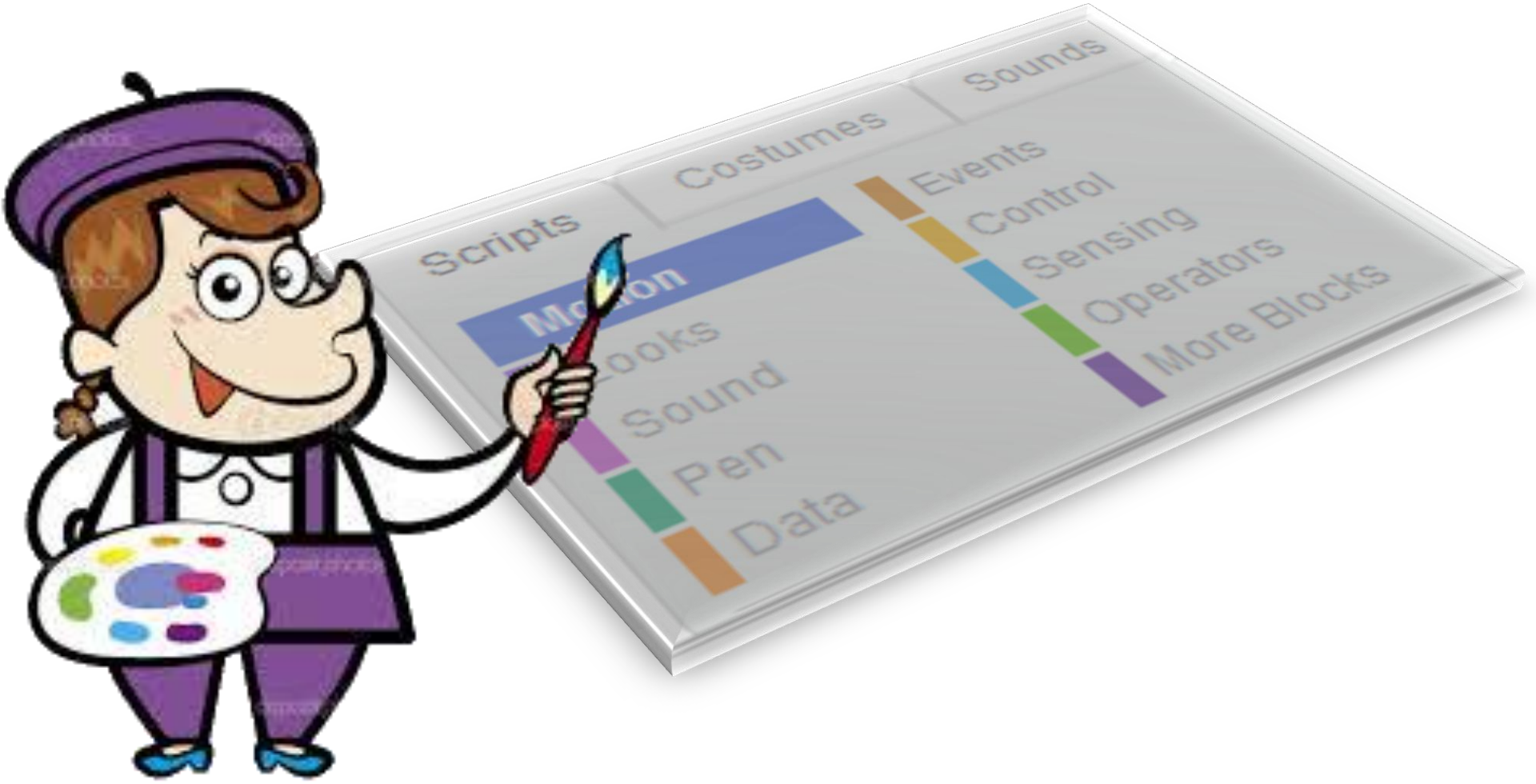


Duplicate Grow Tips

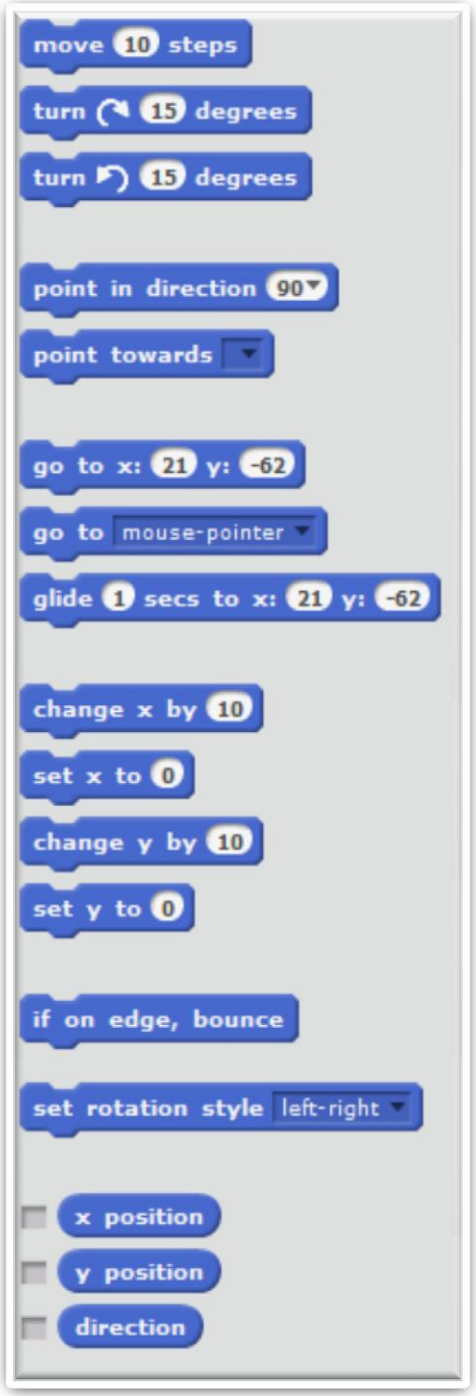


Delete Shrink

Palette of Commands



Motion


move 10 steps
turn 15 degrees
turn 15 degrees
point in direction 90
point towards
go to x: 21 y: -62
go to mouse-pointer
glide 1 secs to x: 21 y: -62
change x by 10
set x to 0
change y by 10
set y to 0
if on edge, bounce
set rotation style left-right
x position
y position
direction

Looks

say Hello! for 2 secs

say Hello!

think Hmm... for 2 secs

think Hmm...

show

hide

switch costume to costume2

next costume

switch backdrop to backdrop1

change color effect by 25

set color effect to 0

clear graphic effects

change size by 10

set size to 100 %

go to front

go back 1 layers

costume #

backdrop name

size

Sound

play sound meow

play sound meow until done

stop all sounds

play drum 1 for 0.25 beats

rest for 0.25 beats

play note 60 for 0.5 beats

set instrument to 1

change volume by -10

set volume to 100 %

volume

change tempo by 20

set tempo to 60 bpm

tempo

Pen

clear

stamp

pen down

pen up

set pen color to

change pen color by 10

set pen color to 0

change pen shade by 10

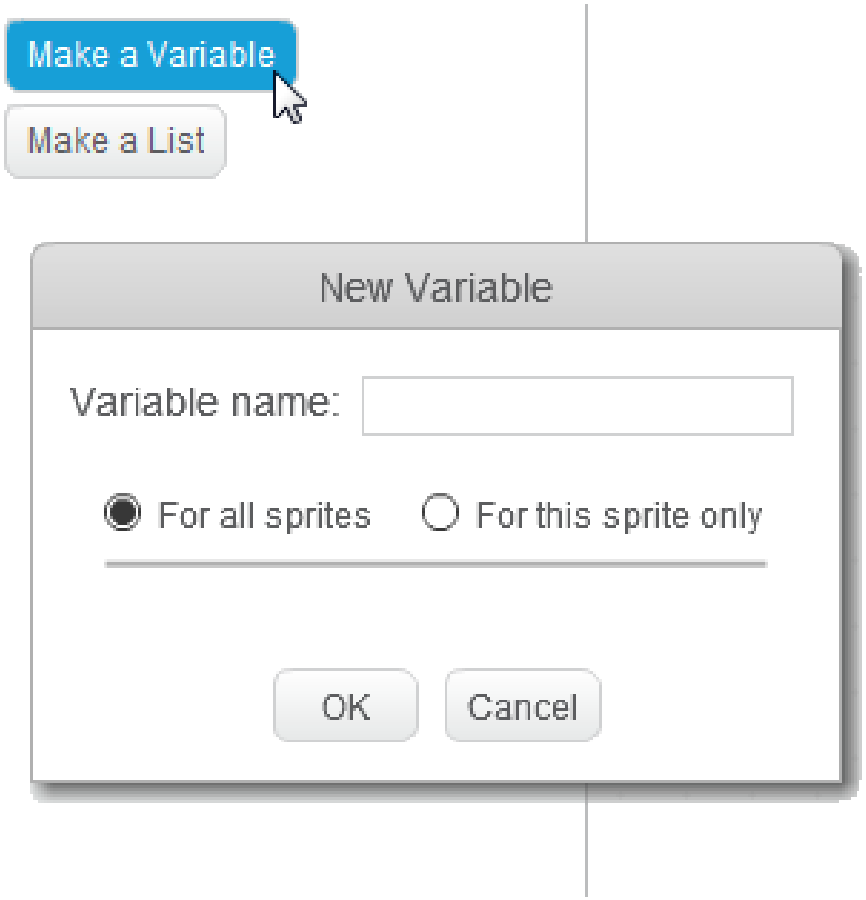
set pen shade to 50

change pen size by 1

set pen size to 1

Data

2x+1=7


Make a Variable
Make a List
New Variable
Variable name:
For all sprites
For this sprite only
OK
Cancel

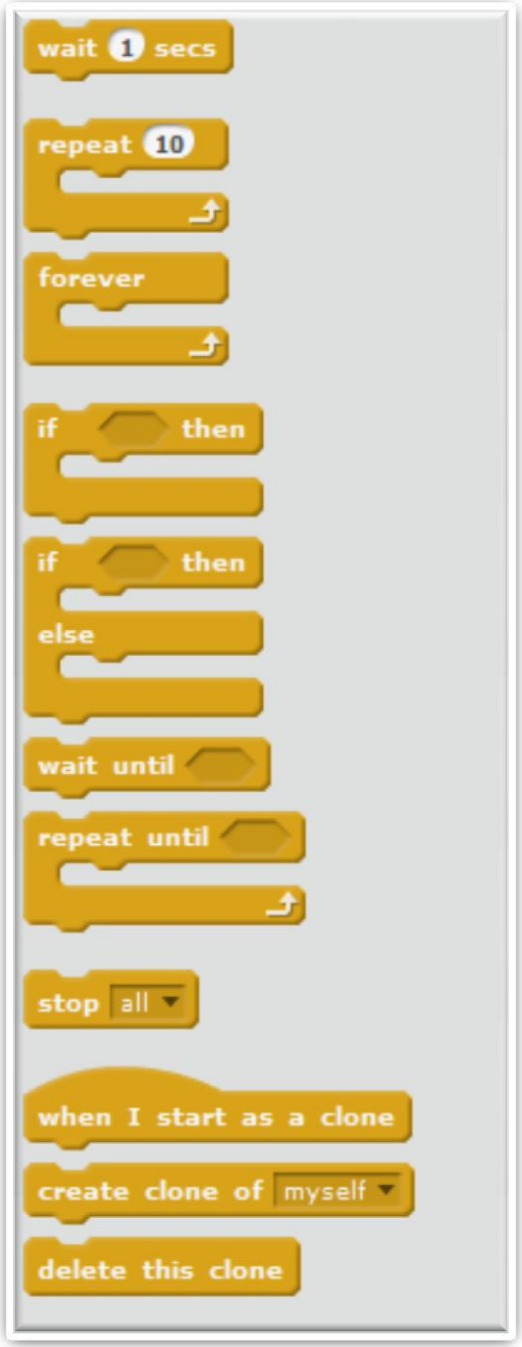
Event


EVENTS


when clicked
when space key pressed
when this sprite clicked
when backdrop switches to back
when loudness > 10
when I receive message1
broadcast message1
broadcast message1 and wait

Control


Do that
10 times


wait 1 secs
repeat 10
forever
if then
if then
else
wait until
repeat until
stop all
when I start as a clone
create clone of myself
delete this clone

Sensing

touching ?

touching color ?

color is touching ?

distance to

ask What's your name? and wait

answer

key space pressed?

mouse down?

mouse x

mouse y

loudness

video motion on this sprite

turn video on

set video transparency to 50 %

timer

reset timer

x position of Sprite1

current minute

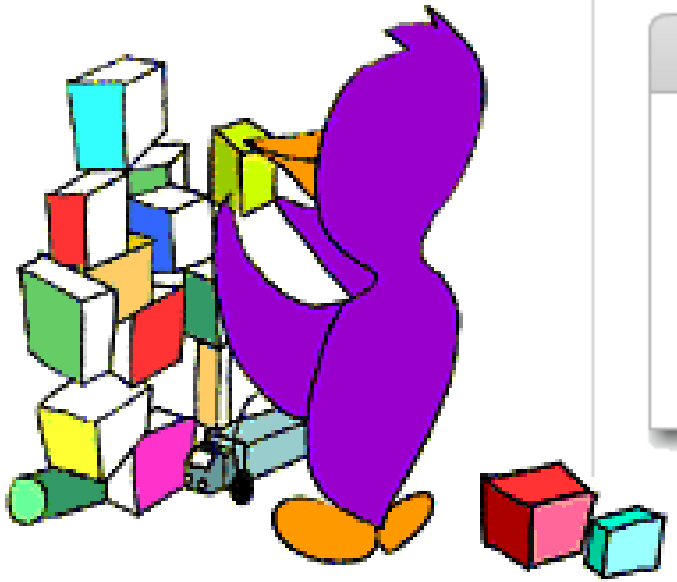
days since 2000

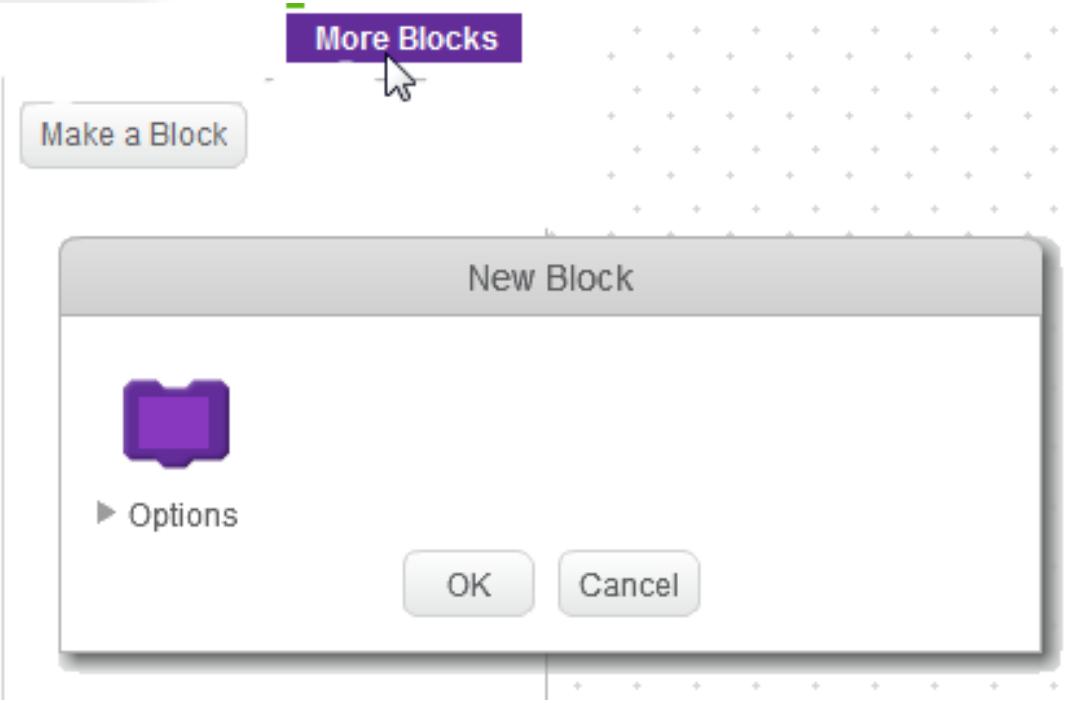
username

Operator


+
-
*
/
pick random 1 to 10
<
=
>
and
or
not
join hello world
letter 1 of world
length of world
mod
round
sqrt of 9

More Blocks





How to Get Started

Plan the Design

- Think first!
- Start simple: add more later

Create First Character

- Design it: appearance & behaviours
- Write script (Code) to control its behaviours

Test It

- Any bugs? (Not working as expected)
- Debug and Improve

Extend It

- More Characters, More Behaviours, More Testing!

How to Make Progress

Our Creative Coding Rule:
There's More Than One Way to Do It!

Try things out and iterate

Save copies: go back if it doesn't work

Talk to others, share ideas, learn from their ideas, improve on their ideas!

Examine other people's code on the Scratch website & upload your code

Steps To Make Our Game

Create **Jaws**: what will he look like?

Code to control him with arrow keys

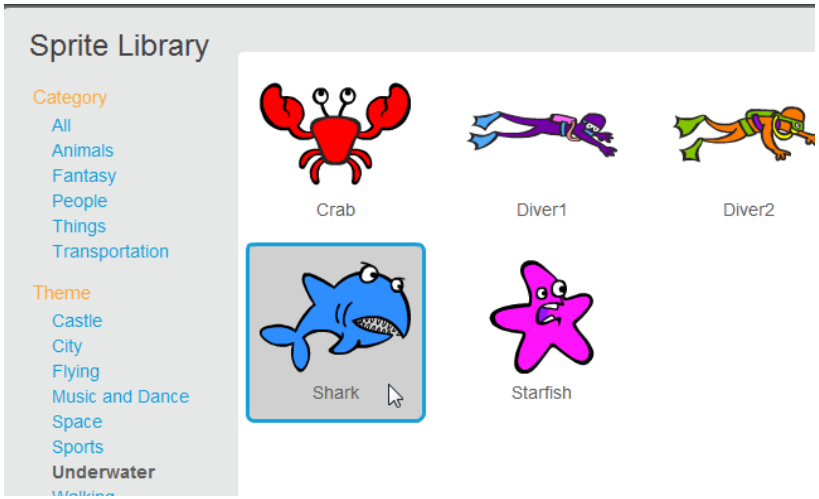
Change the Stage:
Choose a background

Create Diver

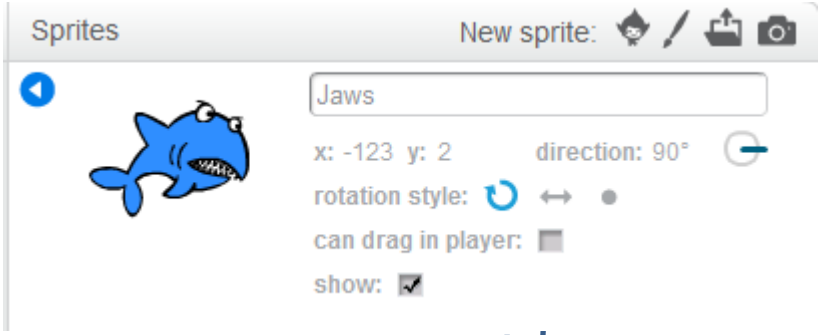
Code to make him move randomly

Create a Sprite

New Sprite:
Select from existing designs

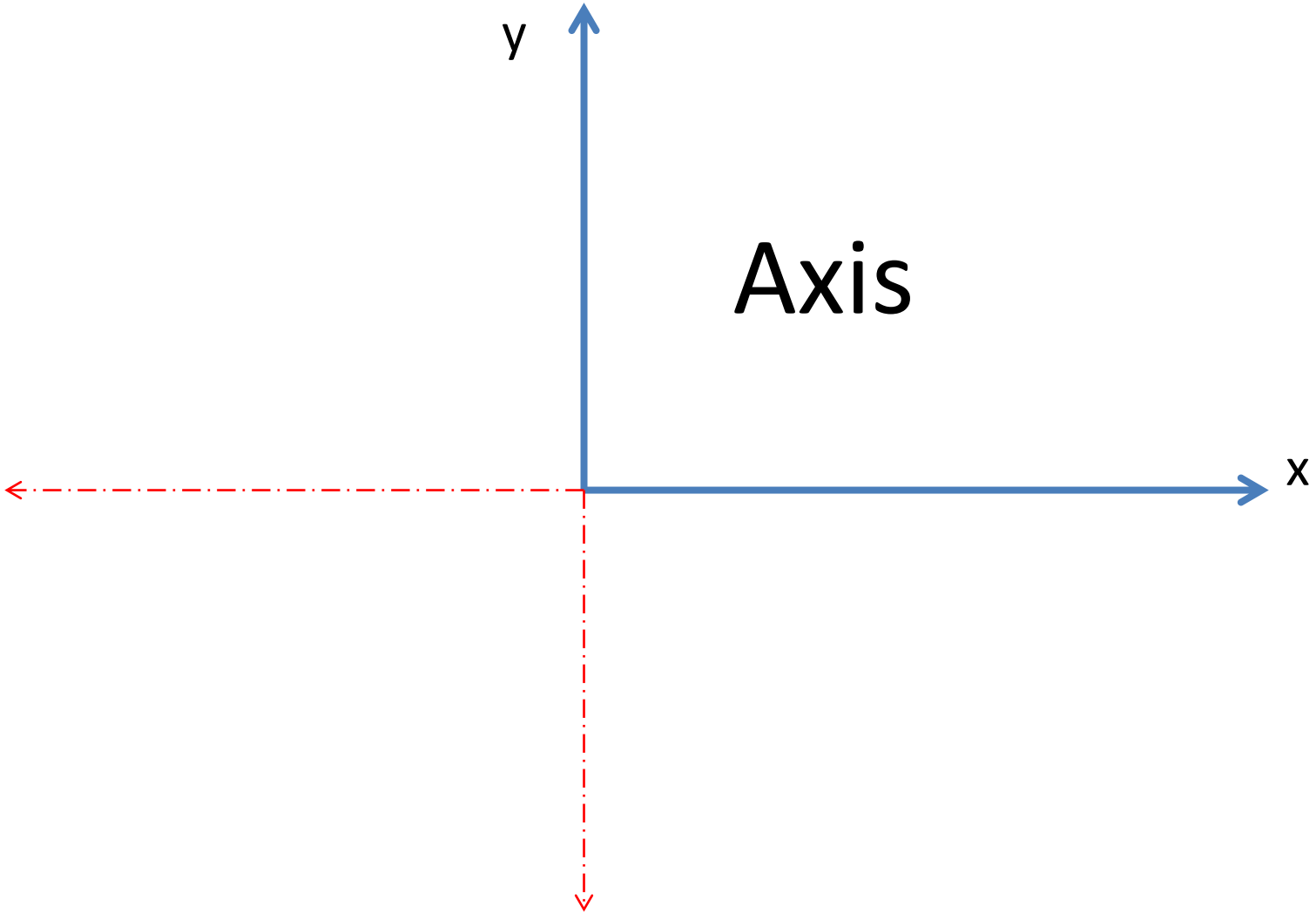


Tip:
Default size is big relative to stage: this shrinks it



Name him:

Make it Move Under Your Control



Make it Move Under Your Control

Moves 10 Steps to the Right

Make it Move Under Your Control

Moves 10 Steps to the Right

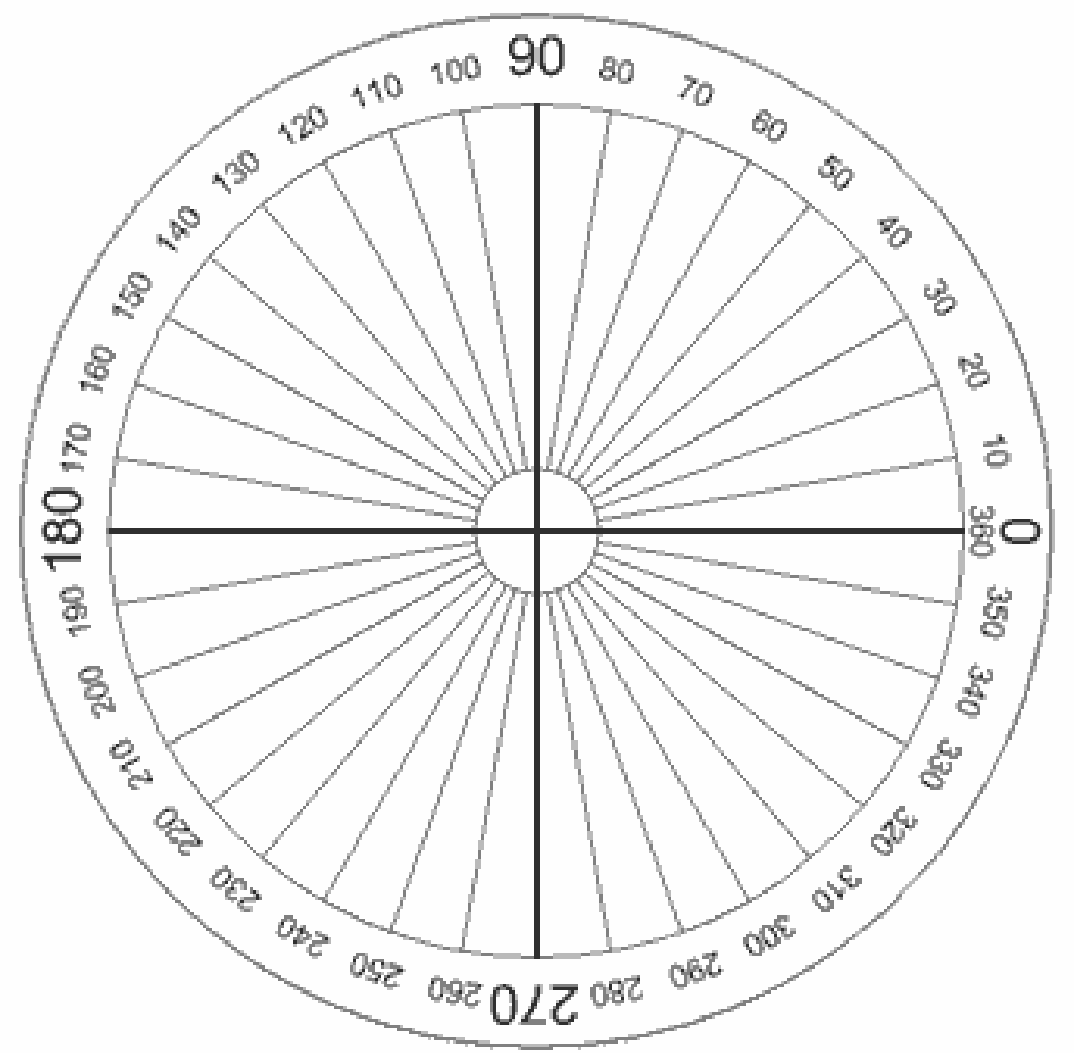
Moves 10 Steps to the Left

Moves 10 Steps Up

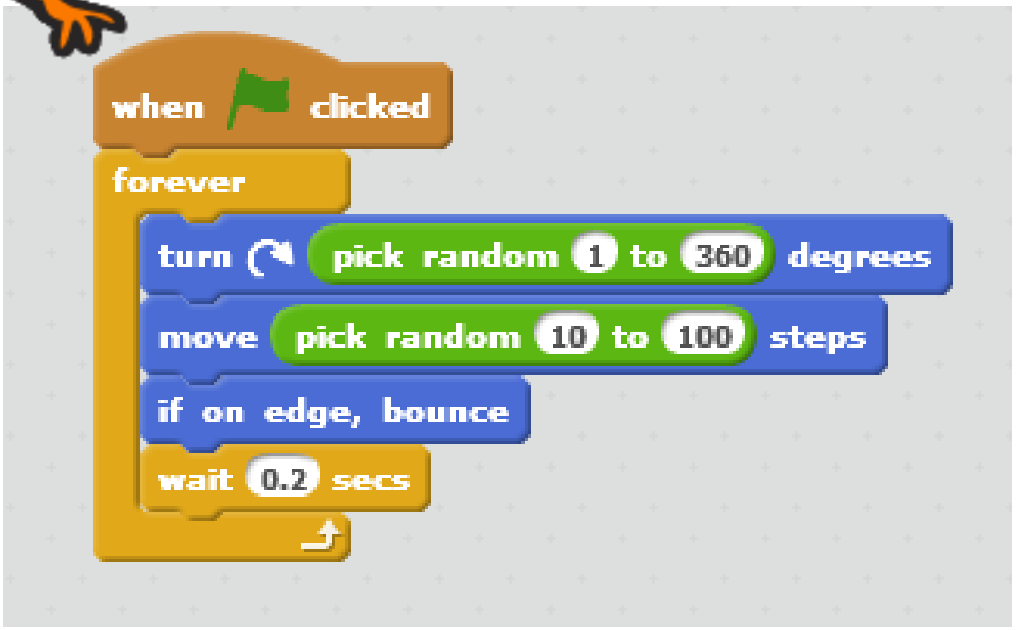
Moves 10 Steps down

Make it Move Under Your Control

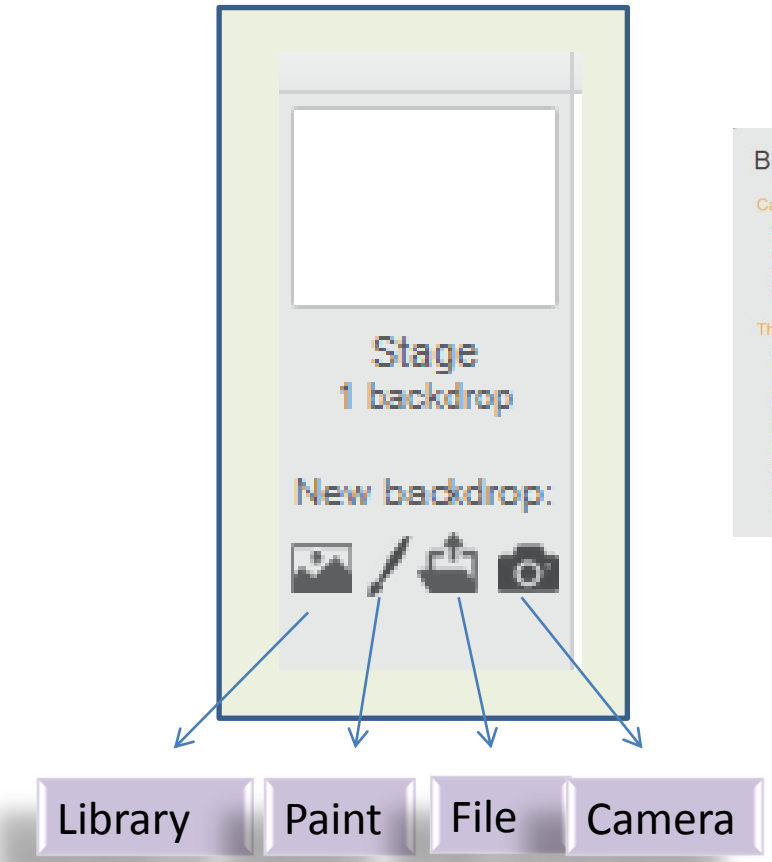
Degrees – Full Circle

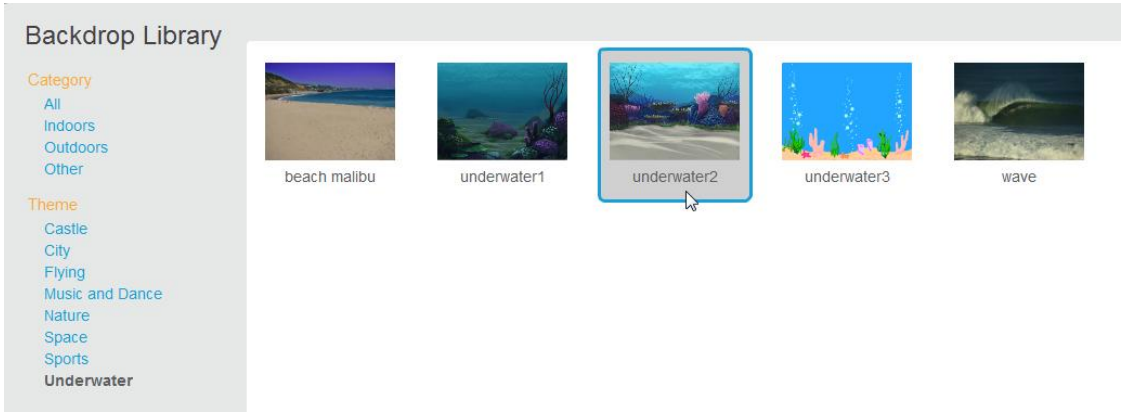


Create Another Sprite that Moves at Random



Change the Background





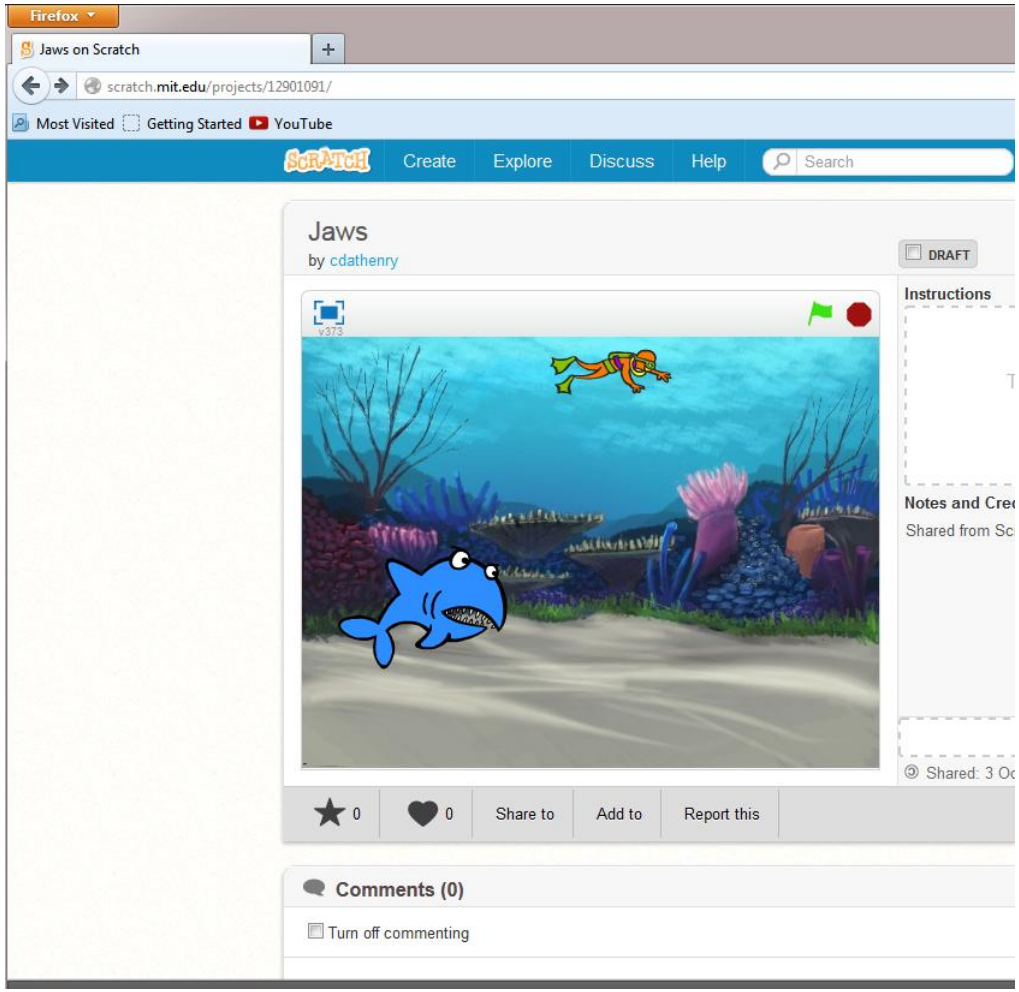
At the End …

Upload your project to the Scratch Website
user: **cdathenry** password: **athenry**

Access it
from home

Improve it

Show your
friends!



Keep In Touch!

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